Holotype.—U. S. Nat. Mus. No. 371067.

Type locality.—Black Bluff, Tombigbee River, sec. 12, T. 16, R. 1 W., Sumter County, Alabama.

Leda jonesi is one of the most common species in the small Black Bluff fauna. Though well represented in the early collections, it was included under "*Yoldia eborea*" Conrad, later *Leda smirna* Dall. Harris (*op. cit.*, 56) noted, however, that "there is considerable variation in the size as well as the shape of this species. The Tombigbee River specimens are larger and longer than those from the Alabama River exposures." The larger size, less trigonal outline, more rounded posterior extremity, and less arcuate ventral margin are sufficiently distinctive to justify the separation of the Black Bluff species from *Leda smirna* of the Matthews Landing, Alabama River, fauna. The differences are significant, for Black Bluff offers the type section of the Sucarnoochee clay while Matthews Landing is the most highly fossiliferous outcrop of the overlying Naheola formation.

I have the pleasure of naming this species in honor of Dr. Walter B. Jones, the State Geologist of Alabama.

ZOOLOGY.—*Field notes and locality records on a collection of amphibians and reptiles chiefly from the western half of the United States. I. Amphibians.*[1] CHARLES E. BURT and MAY DANHEIM BURT, American Museum of Natural History. (Communicated by LEONHARD STEJNEGER.)

During the course of an automobile tour through the western half of the United States, from June 10 to September 15, 1928, the opportunity was taken to collect as many amphibians and reptiles as the time allowed. The following account has been prepared in order to make the locality records obtained available to students of distribution and to put into permanent form the numerous field observations made during the course of the collecting. Every effort has been made to make the determination of species as accurate as possible, but critical taxonomic notes on details of coloration and scutellation have usually been omitted, since in most cases this type of information may best be given by subsequent revisers of the genera concerned.

The opportunity has been taken to include here a series of about forty specimens from the authors' personal collection.[2] All of the specimens here reported, with the exception of a number used in per-

[1] Received October 3, 1929.

[2] Records based on specimens not taken by the authors are associated with the names of the collectors.

sonal exchanges or as gifts to other institutions, are being deposited in the Museum of Zoology of the University of Michigan.

To a number of friends who have generously spent time in the field with us we extend our grateful appreciation. We are especially indebted to Mr. and Mrs. Oliver Millard of San Francisco; Mr. L. M. Klauber of San Diego; Dr. A. P. Williams of Neodesha, Kansas; Mr. W. H. Burt of the Museum of Vertebrate Zoology of the University of California; Mr. and Mrs. Earle M. Landholm of Bristow, Nebraska; and Mr. Howard Shaffer of Haddam, Kansas; likewise, to Dr. Frank N. Blanchard for his kind criticism of this work. Assistance has been obtained from the Museum of Zoology of the University of Michigan.

LIST OF SPECIES

Salamanders

Ambystoma tigrinum (Green).—A large specimen of the tiger salamander, still in the larval state, was collected on Aug. 28 in the muck of a shallow roadside pond 3 miles southeast of Park City, Summit County, Utah.

An adult was found in a tub of rainwater on September 14 at a farm 8 miles north of Bristow, Boyd County, Nebraska, and another adult was observed on the floor of a cellar at the same place, but it escaped by going into an earthen tunnel at the side of the steps.

Batrachoseps attenuatus attenuatus (Eschscholtz).—Two of these little, pinkish salamanders were found on August 12 under rocks in the bed of a small streamlet which flows down the side of Mt. Diablo, Contra Costa County, California. Here, curled up in the damp sand and gravel, they resembled earthworms.

Several large specimens were obtained on August 13 under rocks in a fern bed which had been watered all summer at 217 Upper Terrace, San Francisco, San Francisco County, California.

Toads

Bufo americanus Holbrook.—The males of this species were calling on June 12. Specimens were taken at the edge of the Vermillion River near La Salle, La Salle County, Illinois, and at Deer Park, 6 miles east of La Salle.

Bufo cognatus cognatus (Say).—Nine of these toads were found trapped in the stagnant water of an irrigation sluice 7 miles northwest of Tucson, Pima County, Arizona.

Bufo compactilis Wiegmann.—A large adult was collected on the muddy road at Nulo, El Paso County, Texas, just after a mountain shower which came late in the evening of July 16.

Bufo woodhousii Girard.—These toads are usually abundant where they occur and are easily taken on rainy days. However, when the sun shines they find shelter by burrowing in some damp location, preferably in sand or loose loamy soil, or by hiding beneath loose boards, fallen trees, logs, or other objects. They are frequently seen close to dwellings and in many places they are called "garden toads." The habit of coming from their retreats at night to hop on the road or to sit beneath a street light to catch the insects upon which they prey often results in their death, as evidenced by the number of their flattened bodies to be found at times on some of the main traveled highways.

At Bristow, Boyd County, Nebraska, where a bend of Ponca Creek has been cut off to produce the stagnant "Dead Creek," hundreds of transforming young, tailed to tailless, were observed on the night of June 16, and many were collected. They were particularly abundant on the extensive mud-flats which surrounded this cut-off, although many were on the masses of aquatic vegetation which floated upon the surface of the water. Adults were collected near these young as well as on the side-walks and in the gardens of Bristow. Specimens were also found in an orchard 2 miles to the northeast and along a roadside 5 miles to the north of town.

In Kansas, several specimens were taken at Blue Rapids in Marshall County, and both young and adults were secured on a farm 5 miles north of Haddam in Washington County on June 27, and again on a creek bank 3 miles northeast of Haddam on September 1. The young were all tailless and much larger on the second date. On the afternoon of April 30, 1927, many males were observed congregated in a temporary meadow pool near the Big Salt Marsh in Stafford County. This latter date is probably within the earlier days of the mating period.

Large specimens were taken on the road at Ft. Hancock, El Paso County, Texas, and 1 mile northwest of Canutillo (also in El Paso County). In the latter place they were less than 300 feet from the Rio Grande.

Frogs

Acris gryllus (Le Conte).—This little frog is very common in the middle west in the typical part of its range and frequents a great variety of habitats. Here it may be found at almost any place where there is permanent water—in springs, along water courses, at the edges of ponds, or in marshes, in either clear or muddy, and running or stagnant water. In most places cricket frogs are associated with *Rana pipiens*, although they sometimes occur alone, particularly in the vicinity of the smaller prairie springs. When in danger individuals usually attempt to escape detection by hiding under aquatic vegetation or debris, but at times they hop into some secluded spot upon the bank or upon a surface mat of algae, etc., where they remain perfectly motionless, relying solely upon their concealing coloration and their readiness to change their position for protection. There is remarkable variation in the dorsal ground color of these creatures, even in one locality—many shades and combinations of black, gray, brown, green and yellow being in evidence in large series of living individuals.

In Michigan, specimens were taken 8 miles west of Kalamazoo, Kalamazoo County. — In Illinois at Deer Park, 6 miles east of La Salle, La Salle County; and 10 miles northwest of Elizabeth, Jo Daviess County. — In Iowa, 3 miles southwest of Cedar Falls, Blackhawk County. — In Nebraska, 7 miles east of Brunswick and 2 miles north of Oakdale, Antelope County; Ponca Creek and "Dead Creek"[3] near Bristow, Boyd County; 10 miles south of Beatrice, Gage County; pool on right bank of the Niobrara River near the Bristow Dam and Riverside Park, northern Holt County; 7 miles west and a little south of Norfolk, Madison County; and 1 mile west of Osmond, and 8 miles south of Columbus, Pierce County. — In Kansas, 5 miles south of Clifton, Clay County; 4 miles northwest of Richmond, Franklin County; 2 miles west of Waterville, Marshall County; and from 6 miles east of Haddam, 6 miles north of Haddam, Nutch's Pond (2 miles east of Haddam), 4 miles southeast of Haddam, 7 miles southeast of Enosdale, Morrowville, and just west of Washington, in Washington County. — In Oklahoma, 16 miles north of Coalgate, Coal County; and Owen, Washington County. — In Texas, 7 miles south of Eola, Concho County; 5 miles southwest of Cove, Coryell County; 6 miles east of Rochelle, McCulloch County; and 2 miles south of Lorena, McLennan County.

[3] See mention of this creek under *Bufo woodhousii*, p. 428.

Hyla regilla Baird and Girard.—We took this frog only in San Francisco County, California, and only on the afternoon of August 19. At Lake Merced, near Ingleside, ten individuals were taken from the stems of reeds and rushes at the edge of the water.

A series of 87 specimens was secured in a short time along the banks and in the pools of Islais Creek, just below Mission Bridge, in San Francisco. This creek ordinarily carries a small amount of water and the flow is not rapid. At the point where our specimens were taken there was a rock bottom, but this was often covered over by mud. There were many side pools which were often covered by a combination growth of algae, moss, and duckweed, on the surface of which many frogs were found. Individuals often attempted to escape by diving below this mat of surface vegetation. Tadpoles were seen in the water and metamorphosing forms were found both in the water and out of it.

Down stream, a short distance below Mission Bridge, a sewer empties into Islais Creek, and below this point *Hyla* was not found. Here the aquatic vegetation becomes scanty, the water impure, and the bottom of the stream filled with a barren, black sludge, which is often of considerable depth.

Rana aurora draytonii (Baird and Girard).—Mr. Oliver Millard has sent us a specimen of this form which he collected at a small pond near a stream which flows into Lake Merced, near Ingleside, San Francisco County, California.

Rana boylii boylii (Baird).—On the road from San Rafael to Bolinas in Marin County, California, at a point about 6 miles west of San Rafael, four of these little frogs were found near a roadside spring from which a small streamlet of clear water trickled over a bed of stones and gravel.

Others were secured at the edge of Lake Merced, San Francisco County, California, in moist, but relatively open places. Here two methods of escape were observed: (1) Diving into the water and hiding there under the cover of aquatic vegetation, and (2) jumping into the thickets of land vegetation on the banks above the shore line.

Rana boylii sierrae Camp.—This subspecies was found to be abundant in the vicinity of a fair-sized mountain stream which runs alongside the road from Placerville to Lake Tahoe in Eldorado County, California, at a point about 40 miles west of Lake Tahoe. There was very little vegetation along the broad stream, which flowed moderately and with a depth varying from one to three feet. The bed of the

stream, easily seen through the clear water, was essentially of stones, gravel and sand. The frogs were usually resting at the water's edge, but they jumped into the water and hid under stones as we approached. A number were secured with the fingers after they had been pinned to the rocks under which they were seen to take refuge or after they had been trapped in some under-water crevice.

Mr. Oliver Millard has recently sent us a series of this form which he collected in the Sierra Nevada Mountains along a tributary of the north fork of the Stanislaus River at an elevation of 6500 feet, 15 miles northwest of Calaveras, Calaveras County, California.

Rana catesbeiana Shaw.—Bullfrogs are common along the banks of the larger ponds and streams of the middle west. They are not as widespread in their occurrence here as *Rana pipiens* and *Acris gryllus*, with which they are usually found. Specimens of *Rana catesbeiana* were taken at Nutch's Pond (2 miles east of Haddam), Washington County, and along the banks of the Verdigris River, 4 miles northeast of Neodesha, Wilson County, in KANSAS; and at Owen, Washington County, in OKLAHOMA.

Rana clamitans Latreille.—The green frog was taken only in Illinois. It was found near rather deep pools in Deer Park, 6 miles east of La Salle, La Salle County; and along a stream 10 miles northwest of Elizabeth, Jo Daviess County.

Rana palustris Le Conte.—An adult of this species was collected 10 miles northwest of Elizabeth, Jo Daviess County, Illinois, at the edge of a small, wooded stream, Smallpox Creek.

Rana pipiens Schreber.—The leopard frog is the most common amphibian of the middle west, due, perhaps, to its ability to adapt itself to a great variety of habitats and habitat conditions. It may occur in either clear or muddy water; in shallow ponds or in deep ones; in springs, in creeks or in rivers; and in the mountains or in the lowlands. Its distribution in the typical part of its range seems to be limited only by its ability to reach the permanent bodies of water.

When disturbed, individuals dive beneath aquatic debris, rush into clumps of reeds or sedges in the water, or seek shelter in the weeds or grasses of the bank. They seem to be much more wary in some localities than at others and are always harder to secure at the higher temperatures.

We have often noticed that after the mating season rain causes the amphibian population to spread out, whereas a continued dry period causes it to concentrate about bodies of water or in moist situations.

Thus, on June 27, but a short time after a rain, an adult *Rana pipiens* was found near Haddam, Kansas, high on a hillside above a pond; on June 30, after more rain, specimens were found in the woods, buckbrush, and prairie above a creek near Clifton, Kansas; and on July 16, just after a mountain shower, one was taken from a sandy road at Fort Hancock, Texas.

Two albino frogs of this species were collected with a dip net 3 miles south of Patagonia, Arizona, on July 20. In life these individuals were clear pink and many of their blood vessels could be readily seen. One was a large tadpole and the other was in the transforming stage. The external mouth parts of the tadpole were black, but those of the other albino were pinkish. Typical dorsal spots were present on the transforming specimen as perceptibly darker areas, edged with white.

In ILLINOIS, specimens were taken at La Salle, and in Deer Park, 6 miles east of La Salle, La Salle County. — In IOWA, 3 miles southeast of Cedar Falls, Blackhawk County. — In NEBRASKA, 7 miles east of Brunswick, Antelope County; Bristow, "Dead Creek"[4] and 5 miles northeast of Bristow, Boyd County; 10 miles south of Beatrice, Gage County; pool on right bank of the Niobrara River near Bristow Dam and Riverside Park, northern Holt County; 1 mile east of Osmond, Pierce County; and 8 miles south of Columbus, Platte County. — In KANSAS, 4 miles south of Clifton, Clay County; 4 miles northwest of Richmond, Franklin County; 2 miles west of Waterville, Marshall County; 3 miles east of Prairie View, Phillips County; 6 miles east of Haddam, 6 miles north of Haddam, 3 miles northeast of Haddam. 5 miles southeast of Haddam, 1 mile west of Haddam, Nutch's Pond (2 mi. east of Haddam), just north of Morrowville, 2 miles east of Strawberry, and Washington, Washington County; and Verdigris River, 4 miles northeast of Neodesha, Wilson County. — In TEXAS, Ft. Hancock, El Paso County; 2 miles northwest of Toyahvale, Reeves County; and 2 miles southwest of Big Lake, Tom Green County. — In ARIZONA, 3 miles southwest of Patagonia, Santa Cruz County. — In COLORADO, 3 miles northwest of Deertrail, Arapahoe County; 3 miles east of Denver, Denver County; 2 miles east of Flagler, Kit Carson County; and Bear River, 9 miles east of Craig, 1 mile north of Hayden, 1 mile northwest of Steamboat Springs, and 5 miles northwest of Steamboat Springs, Routt County. — In UTAH, 3 miles southwest of Park City, Summit County; and 4 miles east of Fort Duchesne, Uintah County.

[4] See mention of this creek under *Bufo woodhousii*, p. 428.